REMARKS

This is a full and timely response to the non-final Office Action mailed August 2, 2005 (Paper No. 20040531). Reconsideration and allowance of the Application and presently pending claims are respectfully requested.

I. Indication of Allowable Subject Matter

Applicants greatly appreciate the Examiner's statement in this Office Action in which claim 17 has been indicated as allowable. Applicants have amended claim 17 into independent form and included all of the limitations of the base claim and any intervening claims. Applicants request that claim 17 be allowed.

II. Informalities

Applicants have amended the informalities shown on the first page of the specification with the correct information. Applicants request that the objection be withdrawn.

III. Response to Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 6, 7, 10-12, 18 and 19 stand rejected under 35 U.S.C. §112 as allegedly being indefinite. Applicants have amended the claims to overcome the rejection. Applicants respectfully request the rejection be withdrawn.

IV. Response to Claim Rejections Under 35 U.S.C. §103(a)

Claims 1, 2, 4-6, 8, 9, 11, 15, 16, and 20-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,208,940 to *Kram, et al.* in view of U.S. Patent No. 4,453,401 to *Sidey*. In order for a claim to be properly rejected under 35 U.S.C. §103, the teachings of the prior art reference must suggest all features of the claimed invention to one of ordinary skill in the art. *See, e.g., In re Dow Chemical*, 837 F.2d 469, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988); *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871, 881 (C.C.P.A. 1981).

A. Claim 1

Claim 1, as amended, recites:

> 1. An apparatus for determining *in situ* pore fluid and soil properties, the apparatus comprising:
>
> a penetrating tip member configured to penetrate the soil; and
>
> an attachment module coupled to the penetrating tip member, the attachment module including at least one mandrel, each mandrel including at least one piezo sensor,
>
> wherein ***each piezo sensor is capable of obtaining an in situ measurement of pore pressure at a location corresponding proximal to the at least one mandrel on the attachment module, wherein each piezo sensor is capable of obtaining an in situ measurement of pore pressure independently of measurement data obtained from the penetrating tip member.***
>
> (Emphasis Added)

i. *Kram* fails to disclose and teach at least the above-emphasized elements, particularly the element of "each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure at a location corresponding proximal to the at least one mandrel on the attachment module, wherein each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure independently of measurement data obtained from the penetrating tip member," as recited in claim 1.

In fact, *Kram* appears to disclose "a piezocone for measuring the soil's resistance to penetration and pore water pressure while being advanced into the ground by a rig." (*Kram,* Abstract). *Kram* further discloses that "[the] pore water pressure is measured by a porous element mounted in the conical tip of the piezocone and a pressure transducer mounted in the cylindrical friction sleeve of the piezocone." (*Kram,* Abstract). In short, the *Kram* penetrometer appears to disclose that the conical tip of the piezocone contains sensors that are involved in calculating the pore water pressure. Consequently, Applicants respectfully submit that *Kram* fails to teach or disclose "each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure at a location corresponding proximal to the at least one mandrel on the attachment module, wherein each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure independently of

measurement data obtained from the penetrating tip member." (Emphasis Added). Accordingly, Applicants respectfully submit that the rejection be withdrawn and claim 1 be allowed.

ii. *Sidey* fails to disclose and teach at least the above-emphasized elements, particularly the element of "each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure at a location corresponding proximal to the at least one mandrel on the attachment module, wherein each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure independently of measurement data obtained from the penetrating tip member," as recited in claim 1

In fact, *Sidey* appears to disclose "[a] system for measuring transient pore water pressure in the ground utilizes a probe member having a unique arrangement of a pressure sensor and a soil stress isolation filter." (*Sidey,* Abstract). *Sidey* further discloses the following.

> "The probe member [14] has a body portion with a hollow cavity [104 contained in the probe member's outer tip end 16]. The pressure sensor [preferably] in the form of a [piezoelectric] ceramic [pressure] transducer is mounted in the cavity, and the filter in the form of a circumferential gap formed on the body communicates with the cavity. The filter is also configured for isolating the sensor from effective soil fabric stresses while allowing access to the transducer by pore water pressure. A coupling medium in the form of silicon grease fills the cavity so as to transmit the pore water pressure to the transducer."

(*Sidey,* Abstract).

In short, the *Sidey* penetrometer appears to disclose that the outer tip end 16 of the probe member contains a piezo sensor that is involved in calculating the pore water pressure. Consequently, Applicants respectfully submit that *Sidey* fails to teach or disclose "each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure at a location corresponding proximal to the at least one mandrel on the attachment module, wherein each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure independently of measurement data obtained from the penetrating tip member." (Emphasis Added). Accordingly, Applicants respectfully submit that the rejection be withdrawn and claim 1 be allowed.

iii. The combination of *Kram* and *Sidey* fails to disclose, teach, or suggest each and every element of claims 1

Because *Kram* and *Sidey* fail to disclose, teach, or suggest the above-emphasized features of claim 1, Applicants respectfully submit that the combination of *Kram* and *Sidey* also fails to disclose, teach, or suggest each and every element of claim 1. Thus, a *prima facie* case of obviousness is not established based on *Kram* and *Sidey*. Consequently, for at least this reason, among others, Applicants respectfully request that claim 1 be allowed and the rejection be withdrawn.

B. Claim 15

Claim 15, as amended, recites:

> 15. A method of determining *in situ* pore fluid and soil properties, the method comprising the steps of:
> positioning a penetrating tip member so as to penetrate into the soil at a particular subsurface area;
> positioning an attachment module in a predetermined relationship to the penetrating tip member to form a penetrometer;
> forcing the penetrometer into the soil beginning with the penetrating tip member;
> collecting attachment module measurements from at least one piezo sensor coupled to at least one mandrel; and
> ***obtaining an in situ measurement of pore fluid pressure at a depth that corresponds to the location of the at least one mandrel from the at least one piezo sensor, wherein each piezo sensor is capable of obtaining an in situ measurement of pore pressure independently of measurement data obtained from the penetrating tip member.***
>
> (Emphasis Added)

As mentioned above, the *Kram* penetrometer appears to disclose that the conical tip of the piezocone contains sensors that are involved in calculating the pore water pressure and the *Sidey* penetrometer appears to disclose that the probe member's outer tip end 16 contains a piezo sensor that is involved in calculating the pore water pressure. Consequently, Applicants respectfully submit that *Kram* and *Sidey* fail to teach or disclose the feature of "obtaining an *in situ* measurement of pore fluid pressure at a depth that corresponds to the location of the at least one mandrel from the at least one piezo

sensor, wherein each piezo sensor is capable of obtaining an *in situ* measurement of pore pressure independently of measurement data obtained from the penetrating tip member." Thus, a *prima facie* case of obviousness is not established based on *Kram* and *Sidey*. Accordingly, for at least this reason, among others, Applicants respectfully submit that the rejection be withdrawn and claim 15 be allowed.

C. Dependent Claims

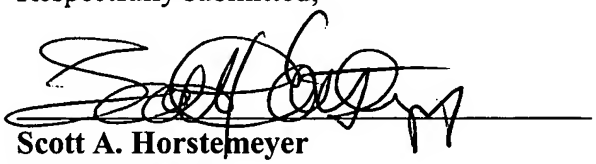
Because independent claims 1 and 15 are allowable over the cited art of record, dependent claims 2-14 and 16-23 are allowable as a matter of law for at least the reason that dependent claims 2-14 and 16-23 contain all features and elements of their respective independent base claims. *See, e.g., In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Accordingly, the rejection to dependent claims 2-14 and 16-23 should be withdrawn for at least this reason, among others.

CONCLUSION

The Applicants respectfully submit that all claims are now in condition for allowance, and request that the Examiner passes this case to issuance. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

No fee is believed to be due in connection with this response. If, however, any fee is deemed to be payable, you are hereby authorized to charge any such fee to Deposit Account No. 20-0778.

Respectfully submitted,



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